FIG. 1(a)

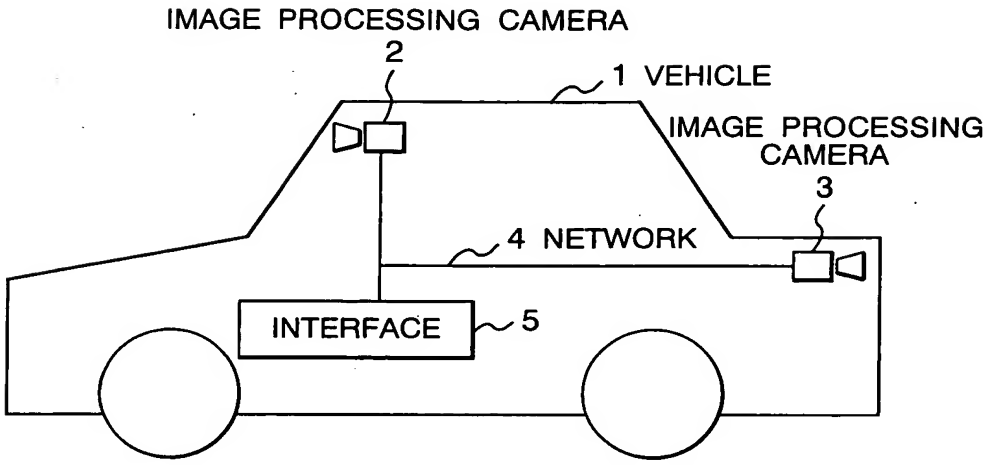


IMAGE PROCESSING CAMERA
2
1 VEHICLE
IMAGE PROCESSING CAMERA
3
4 NETWORK
INTERFACE
5

FIG. 1(b)

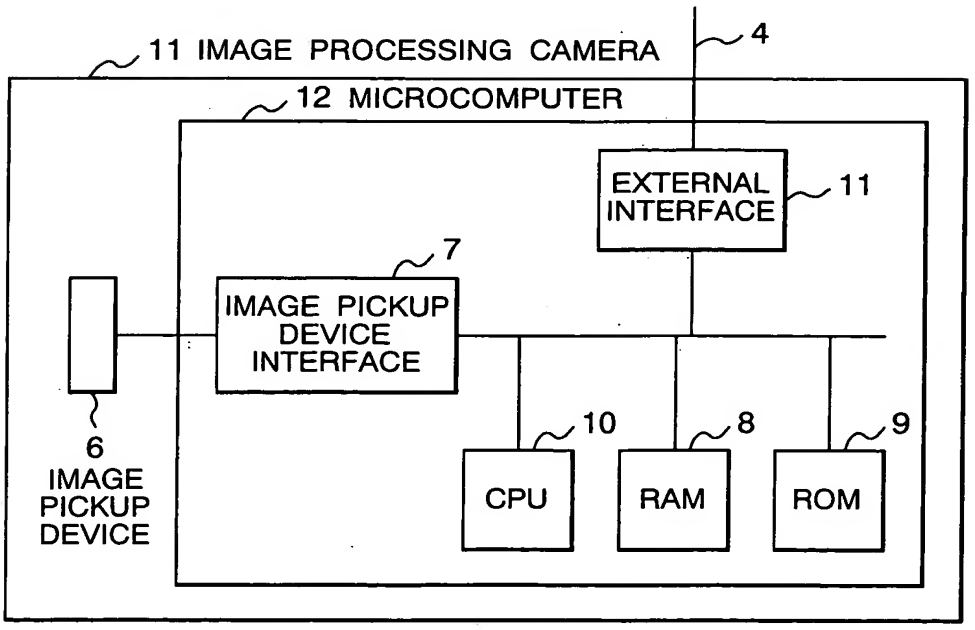

11 IMAGE PROCESSING CAMERA
4
12 MICROCOMPUTER
EXTERNAL INTERFACE
11
7
IMAGE PICKUP DEVICE INTERFACE
6
IMAGE PICKUP DEVICE
10
8
9
CPU
RAM
ROM

FIG. 2

APPLICATION	IMAGE QUALITY	RATE	CAMERA CONTROL	IMAGE PROCESSING FUNCTION
MONITORING	–	HIGH	FOR MONITORING	IMAGE DOWNSCALING AND EDGE ENHANCEMENT
DRIVE RECORDER	–	LOW	FOR MONITORING	IMAGE COMPRESSION AND DATA INTEGRATION
VIDEO ALBUM (HIGH IMAGE QUALITY)	HIGH	HIGH	FOR MONITORING	IMAGE COMPRESSION AND COLOR CORRECTION
VIDEO ALBUM (LOW IMAGE QUALITY)	LOW	LOW	FOR MONITORING	IMAGE COMPRESSION AND COLOR CORRECTION
AUTOMATIC LIGHT CONTROL	–	LOW	FAST/SLOW SHUTTERING AND COLOR CONTROL	MEASUREMENT OF EXTERNAL ILLUMINATION AND VEHICLE DETECTION
LANE DEVIATION ALARM	–	MEDIUM	FAST/SLOW SHUTTERING	LANE RECOGNITION
INTRUDING VEHICLE ALARM	–	MEDIUM	FAST/SLOW SHUTTERING AND COLOR CONTROL	LANE RECOGNITION AND VEHICLE DETECTION
PASSING VEHICLE ALARM	–	MEDIUM	FAST/SLOW SHUTTERING AND COLOR CONTROL	VEHICLE DETECTION
PARKING ASSISTANCE	–	LOW	FAST/SLOW SHUTTERING	OBSTACLE DETECTION AND PARKING-FRAME DETECTION
LANE KEEPING ASSISTANCE	–	MEDIUM	FAST/SLOW SHUTTERING	LANE RECOGNITION
COLLISION ALLEVIATION	–	HIGH	OPTIMUM SHUTTERING	DETECTION OF VEHICLES AND OBSTACLES
COLLISION AVOIDANCE	–	HIGH	OPTIMUM SHUTTERING	LANE RECOGNITION AND DETECTION OF VEHICLES AND OBSTACLES

(-: NOT DEFINED)

FIG. 3

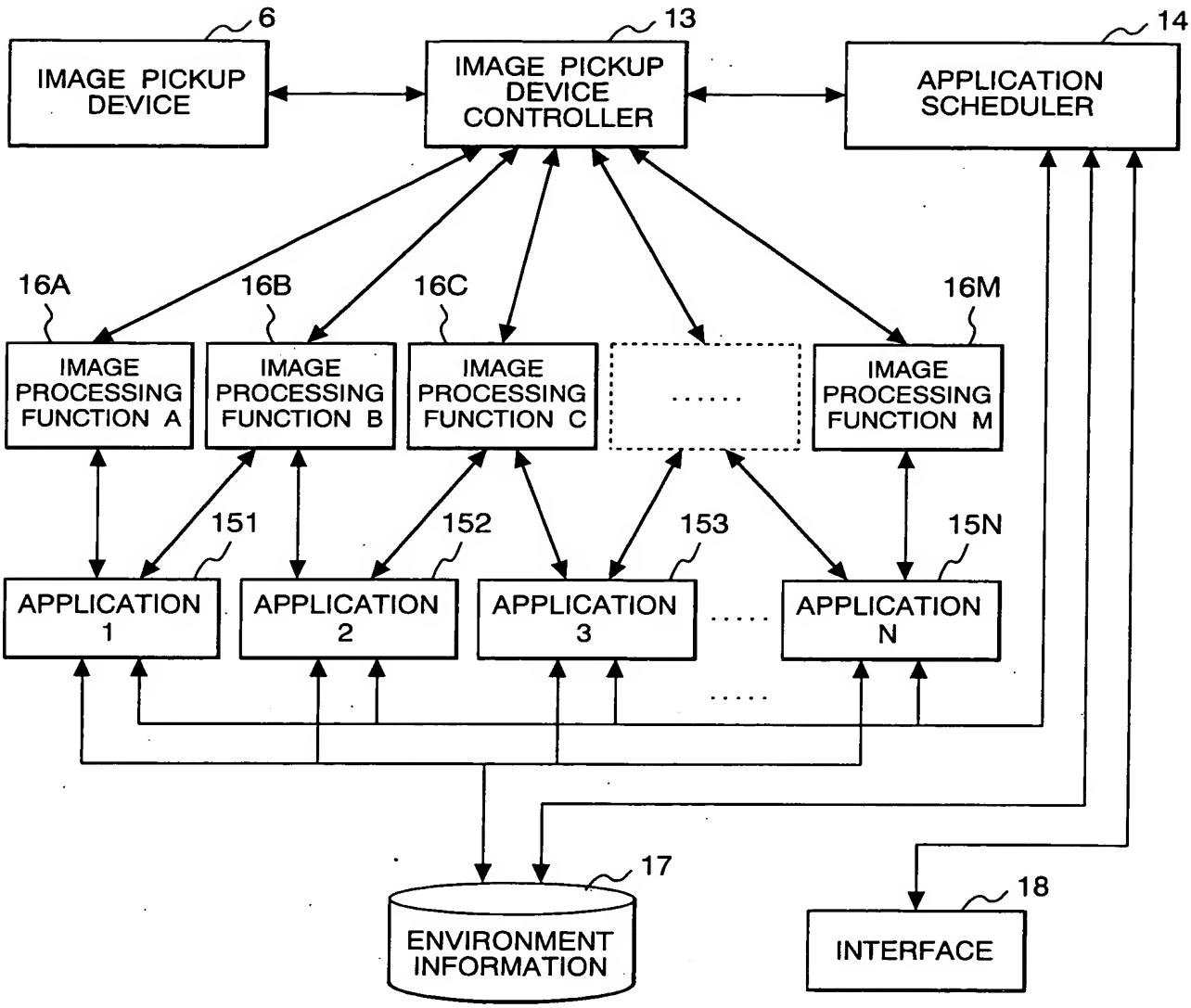

6
IMAGE PICKUP DEVICE
13
IMAGE PICKUP DEVICE CONTROLLER
14
APPLICATION SCHEDULER
16A
16B
16C
16M
IMAGE PROCESSING FUNCTION A
IMAGE PROCESSING FUNCTION B
IMAGE PROCESSING FUNCTION C
.....
IMAGE PROCESSING FUNCTION M
151
152
153
15N
APPLICATION 1
APPLICATION 2
APPLICATION 3
APPLICATION N
17
ENVIRONMENT INFORMATION
18
INTERFACE

FIG. 4

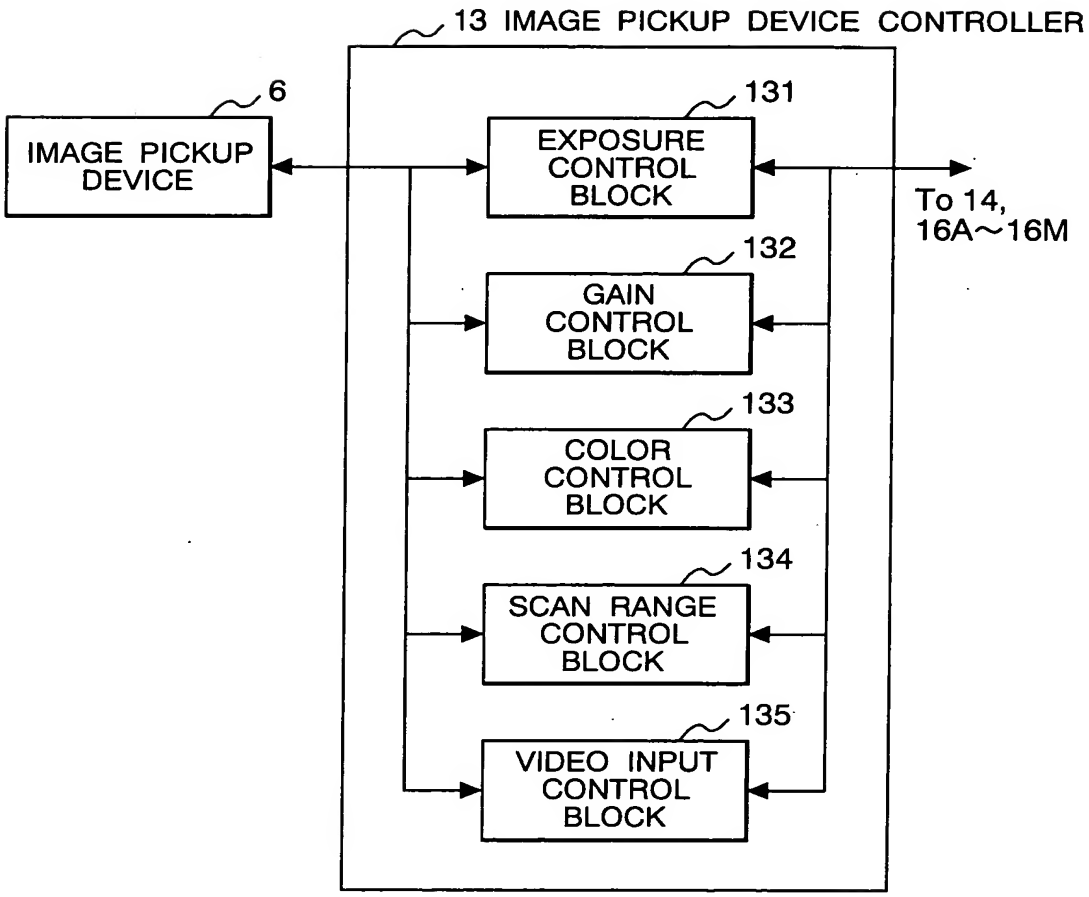

13 IMAGE PICKUP DEVICE CONTROLLER
6
IMAGE PICKUP DEVICE
131
EXPOSURE CONTROL BLOCK
To 14, 16A~16M
132
GAIN CONTROL BLOCK
133
COLOR CONTROL BLOCK
134
SCAN RANGE CONTROL BLOCK
135
VIDEO INPUT CONTROL BLOCK

FIG. 5

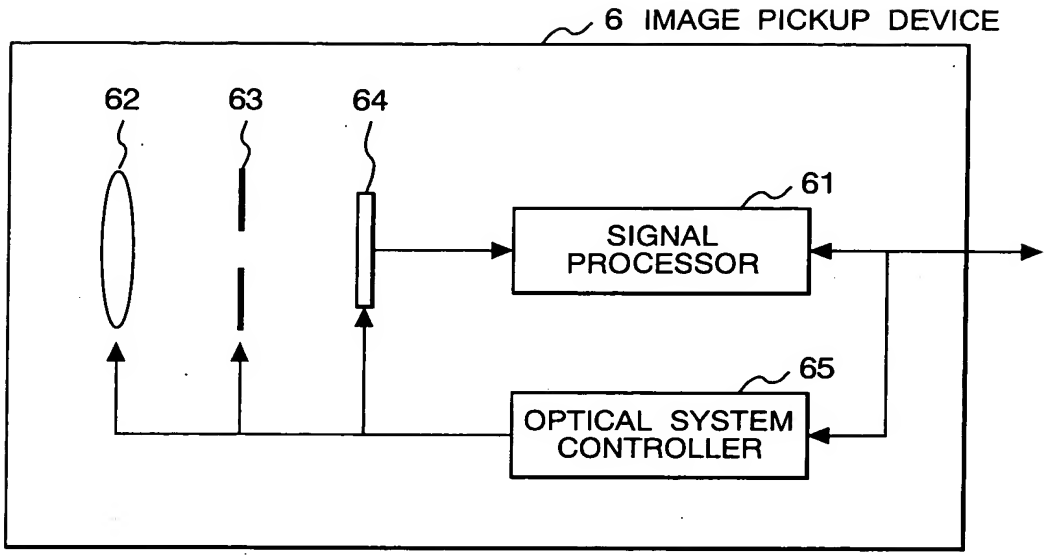

6 IMAGE PICKUP DEVICE
62
63
64
61
SIGNAL PROCESSOR
65
OPTICAL SYSTEM CONTROLLER

FIG. 6

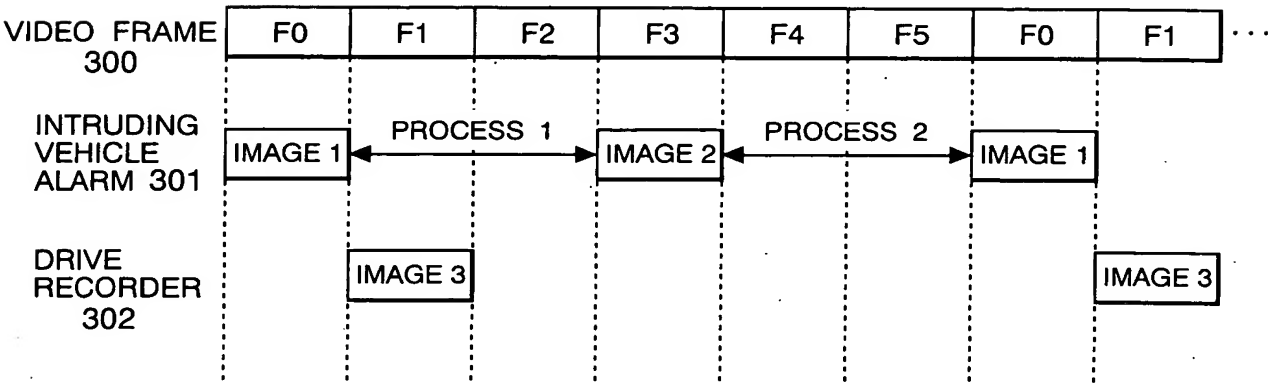

VIDEO FRAME 300
F0
F1
F2
F3
F4
F5
F0
F1
INTRUDING VEHICLE ALARM 301
IMAGE 1
PROCESS 1
IMAGE 2
PROCESS 2
IMAGE 1
DRIVE RECORDER 302
IMAGE 3
IMAGE 3

FIG. 7

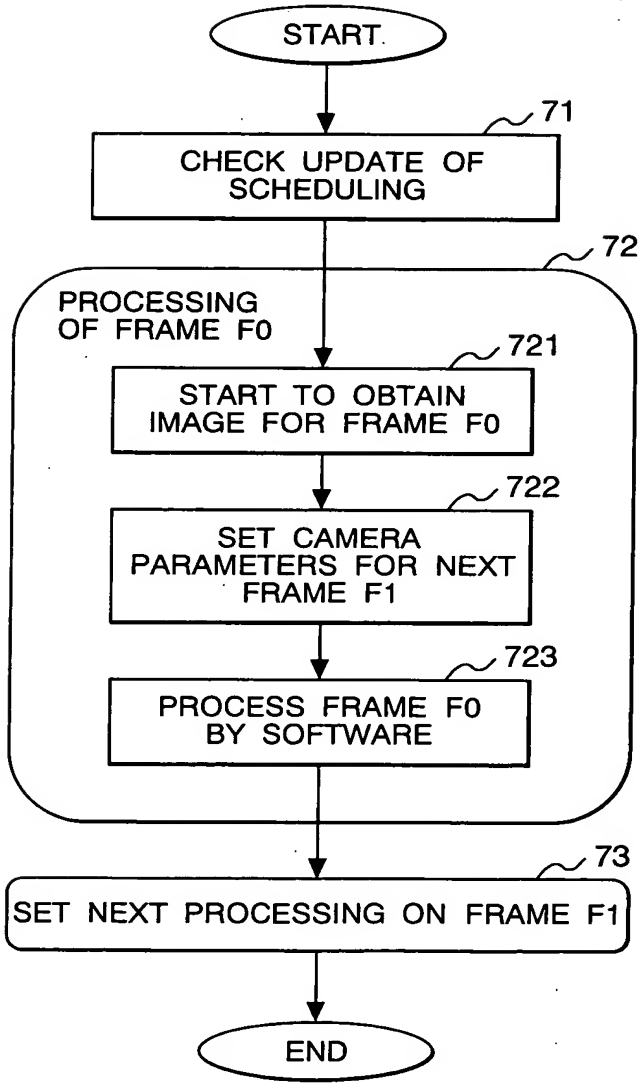

START
71
CHECK UPDATE OF SCHEDULING
72
PROCESSING OF FRAME F0
721
START TO OBTAIN IMAGE FOR FRAME F0
722
SET CAMERA PARAMETERS FOR NEXT FRAME F1
723
PROCESS FRAME F0 BY SOFTWARE
73
SET NEXT PROCESSING ON FRAME F1
END

FIG. 8(a)

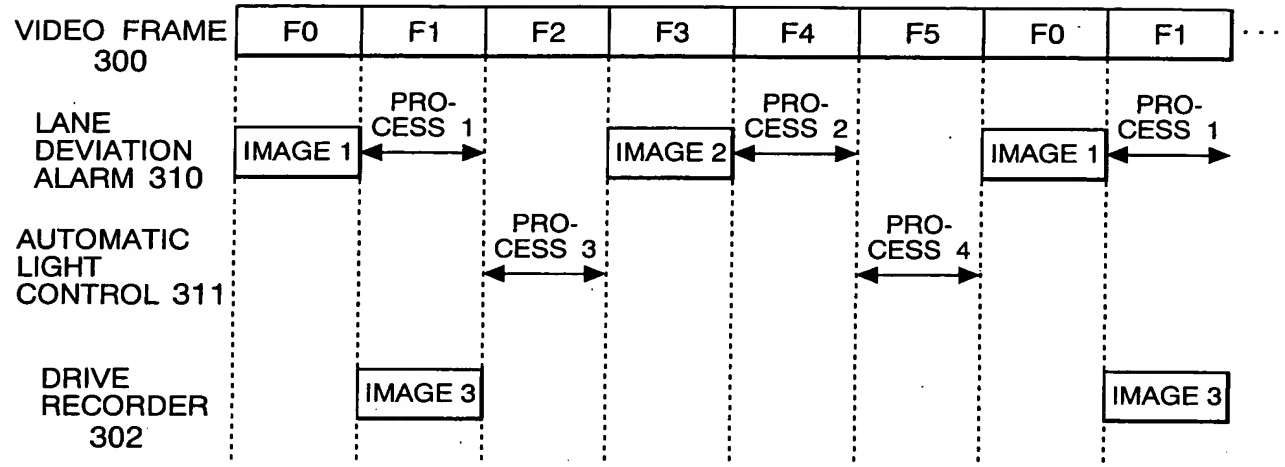

VIDEO FRAME 300
F0
F1
F2
F3
F4
F5
F0
F1
LANE DEVIATION ALARM 310
IMAGE 1
PRO-CESS 1
IMAGE 2
PRO-CESS 2
IMAGE 1
PRO-CESS 1
AUTOMATIC LIGHT CONTROL 311
PRO-CESS 3
PRO-CESS 4
DRIVE RECORDER 302
IMAGE 3
IMAGE 3

FIG. 8(b)

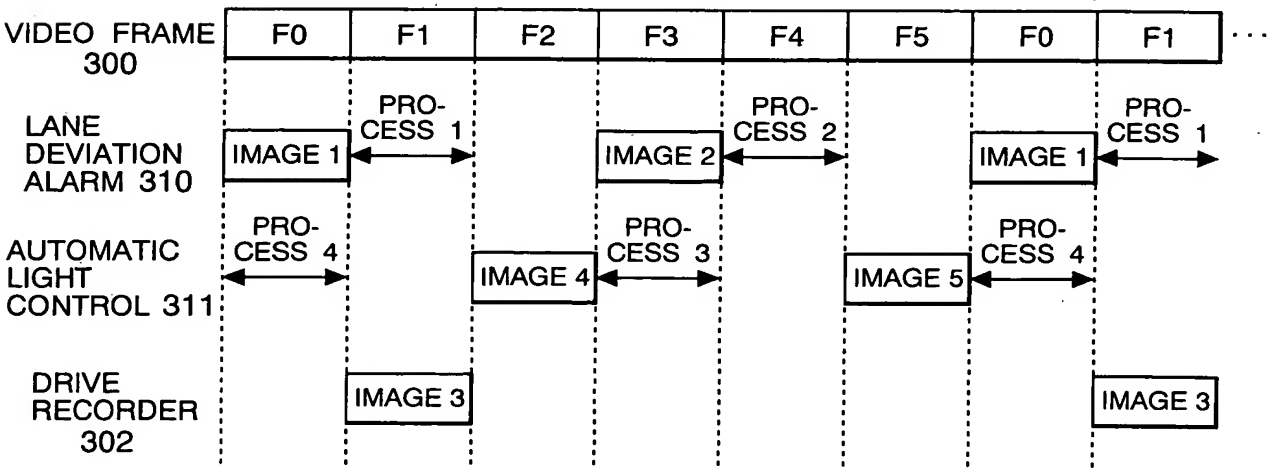

VIDEO FRAME 300
F0
F1
F2
F3
F4
F5
F0
F1
LANE DEVIATION ALARM 310
IMAGE 1
PRO-CESS 1
IMAGE 2
PRO-CESS 2
IMAGE 1
PRO-CESS 1
AUTOMATIC LIGHT CONTROL 311
PRO-CESS 4
PRO-CESS 3
PRO-CESS 4
IMAGE 4
IMAGE 5
DRIVE RECORDER 302
IMAGE 3
IMAGE 3

FIG. 9(a)

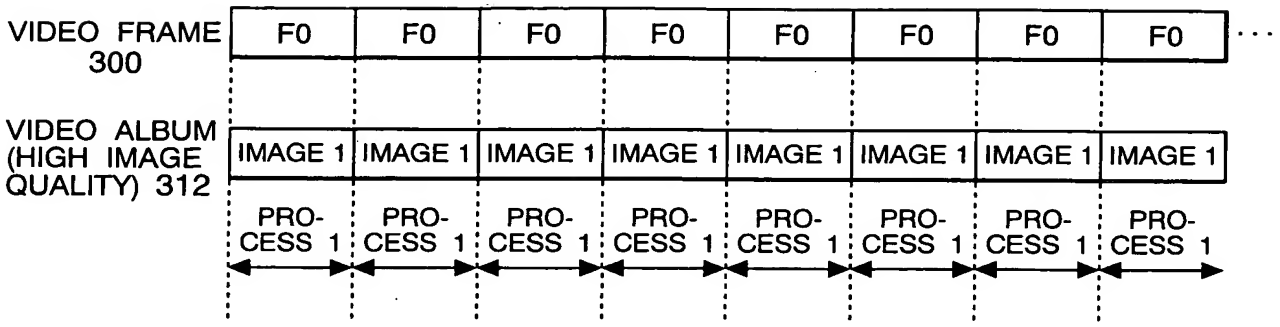

VIDEO FRAME 300
F0
F0
F0
F0
F0
F0
F0
F0
VIDEO ALBUM (HIGH IMAGE QUALITY) 312
IMAGE 1
IMAGE 1
IMAGE 1
IMAGE 1
IMAGE 1
IMAGE 1
IMAGE 1
IMAGE 1
PRO-CESS 1
PRO-CESS 1
PRO-CESS 1
PRO-CESS 1
PRO-CESS 1
PRO-CESS 1
PRO-CESS 1
PRO-CESS 1

FIG. 9(b)

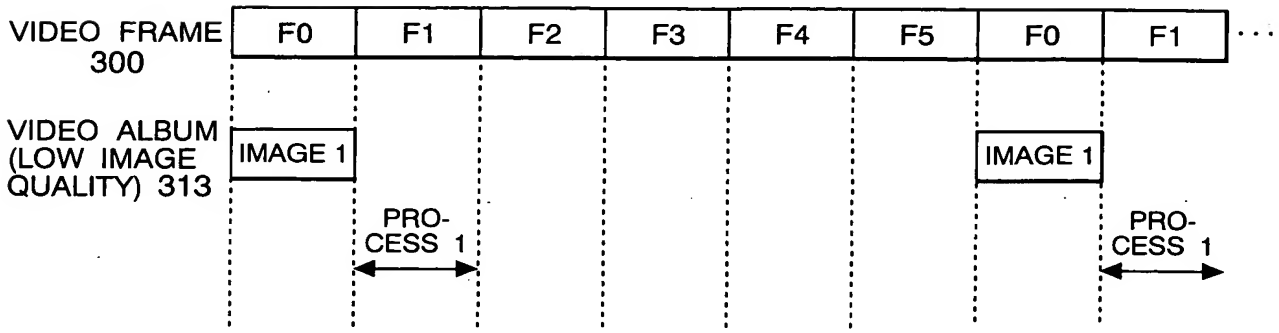

VIDEO FRAME 300
F0
F1
F2
F3
F4
F5
F0
F1
VIDEO ALBUM (LOW IMAGE QUALITY) 313
IMAGE 1
IMAGE 1
PRO-CESS 1
PRO-CESS 1

FIG. 10(a)

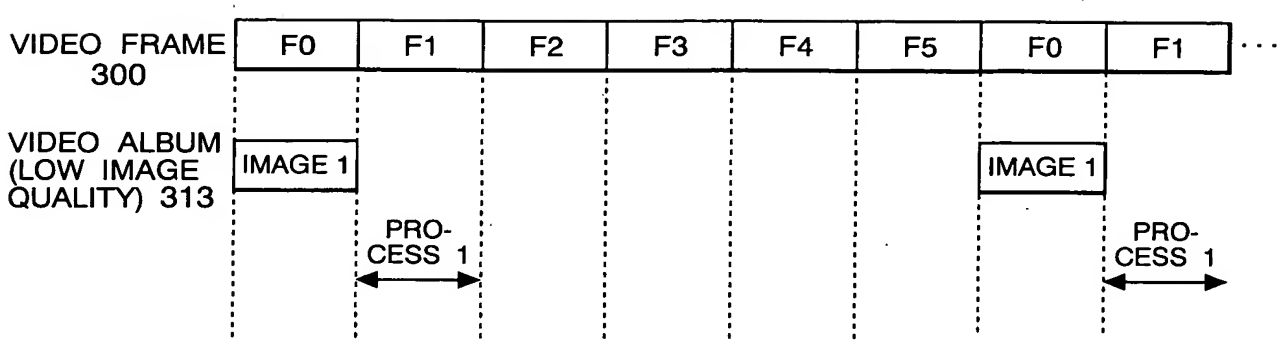


FIG. 10(b)

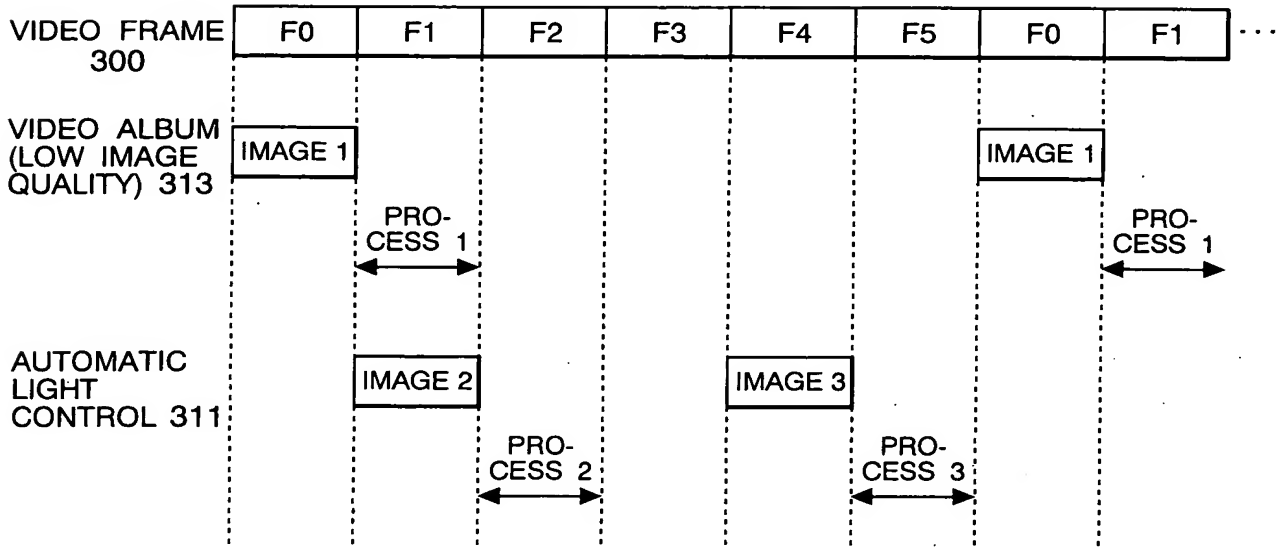


FIG. 11

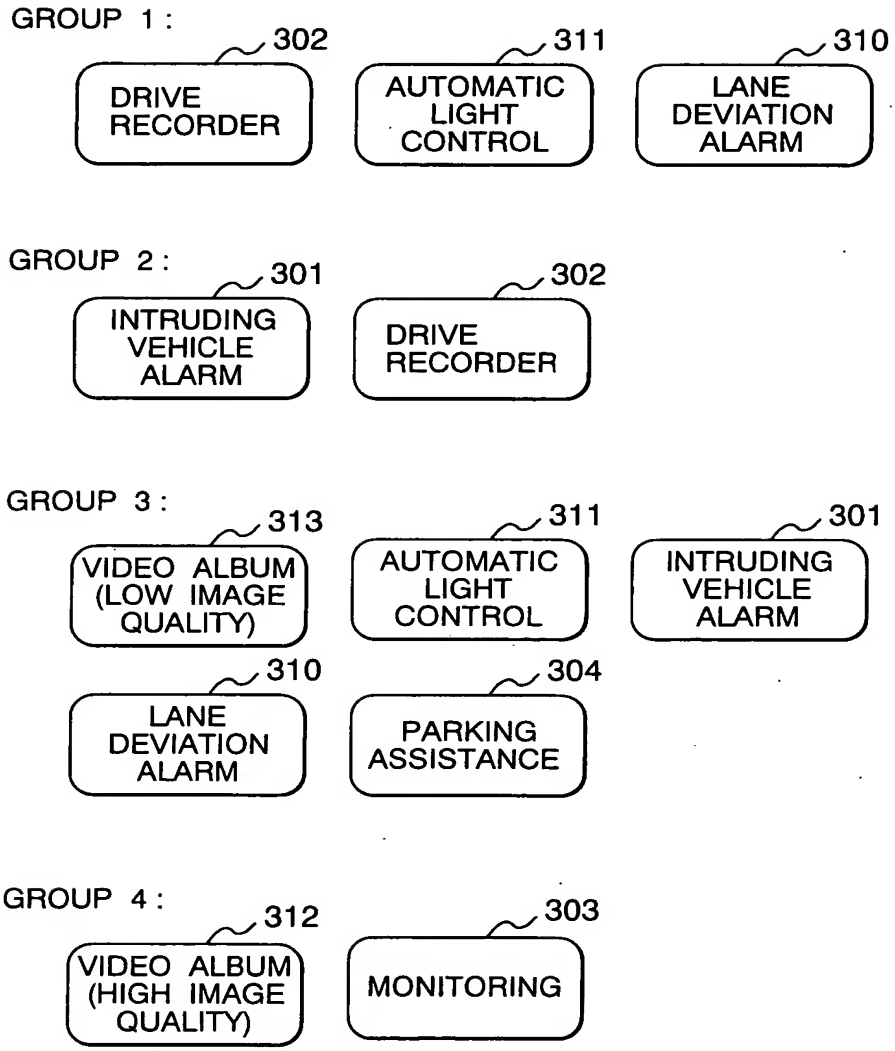

GROUP 1 :
302
DRIVE RECORDER
311
AUTOMATIC LIGHT CONTROL
310
LANE DEVIATION ALARM
GROUP 2 :
301
INTRUDING VEHICLE ALARM
302
DRIVE RECORDER
GROUP 3 :
313
VIDEO ALBUM (LOW IMAGE QUALITY)
311
AUTOMATIC LIGHT CONTROL
301
INTRUDING VEHICLE ALARM
310
LANE DEVIATION ALARM
304
PARKING ASSISTANCE
GROUP 4 :
312
VIDEO ALBUM (HIGH IMAGE QUALITY)
303
MONITORING

FIG. 12

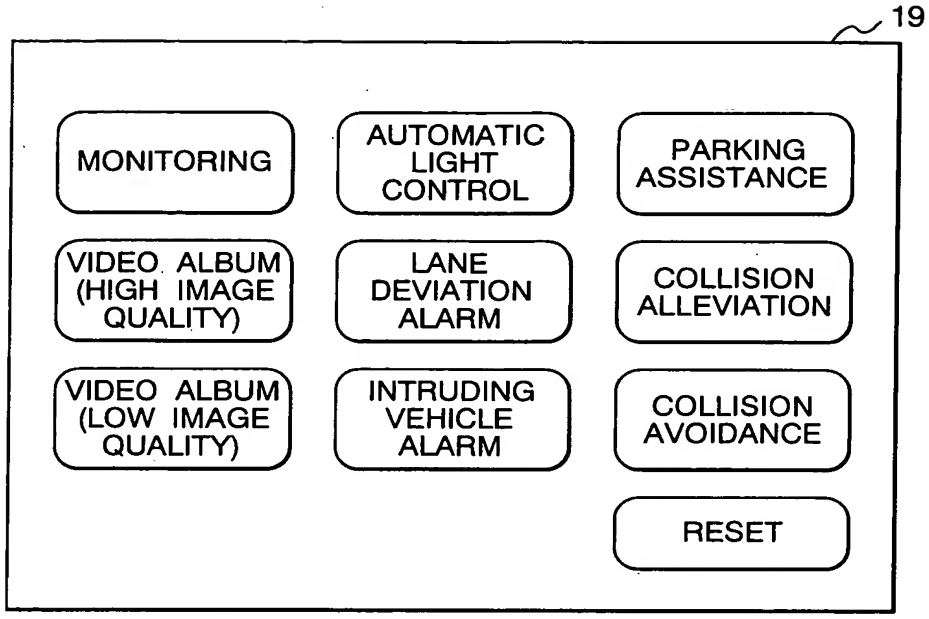

19
MONITORING
AUTOMATIC LIGHT CONTROL
PARKING ASSISTANCE
VIDEO ALBUM (HIGH IMAGE QUALITY)
LANE DEVIATION ALARM
COLLISION ALLEVIATION
VIDEO ALBUM (LOW IMAGE QUALITY)
INTRUDING VEHICLE ALARM
COLLISION AVOIDANCE
RESET

FIG. 13

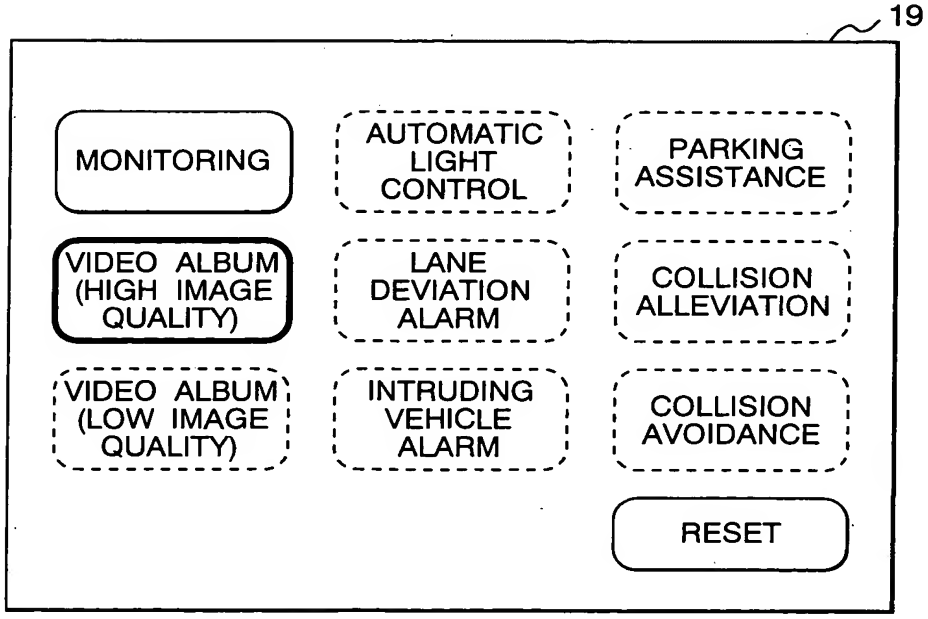

19
MONITORING
AUTOMATIC LIGHT CONTROL
PARKING ASSISTANCE
VIDEO ALBUM (HIGH IMAGE QUALITY)
LANE DEVIATION ALARM
COLLISION ALLEVIATION
VIDEO ALBUM (LOW IMAGE QUALITY)
INTRUDING VEHICLE ALARM
COLLISION AVOIDANCE
RESET

FIG. 14(a)

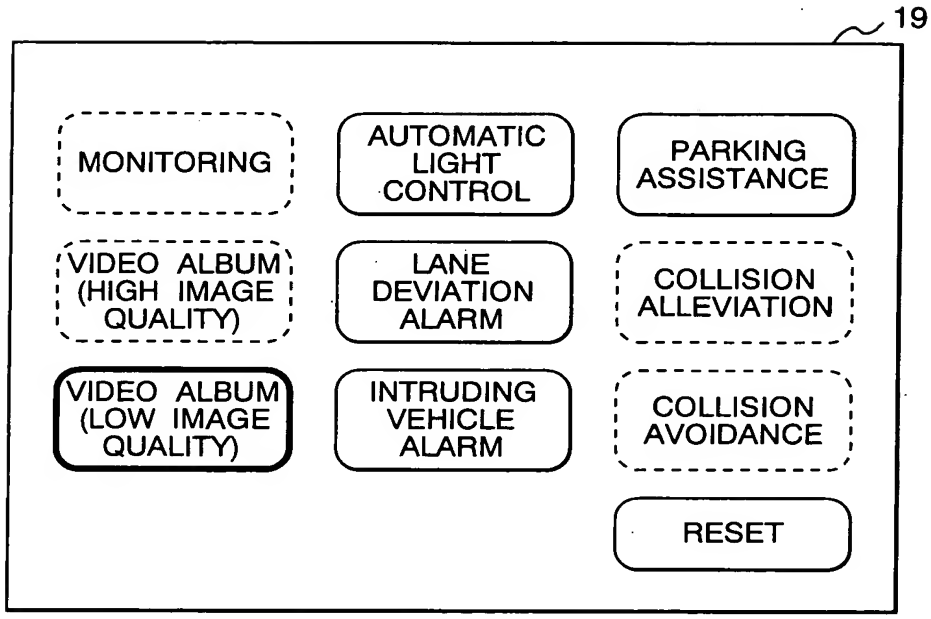


FIG. 14(b)

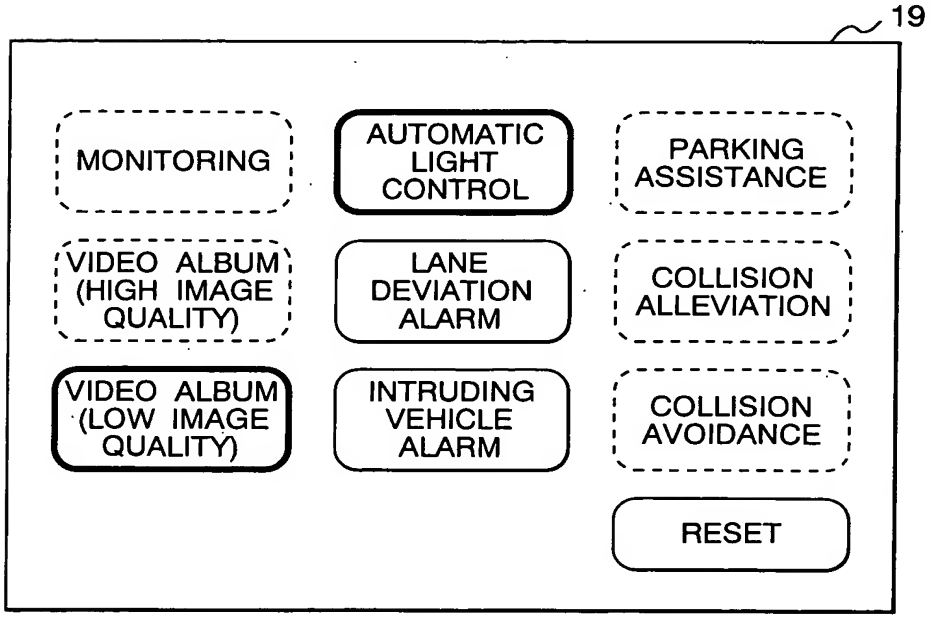


FIG. 15

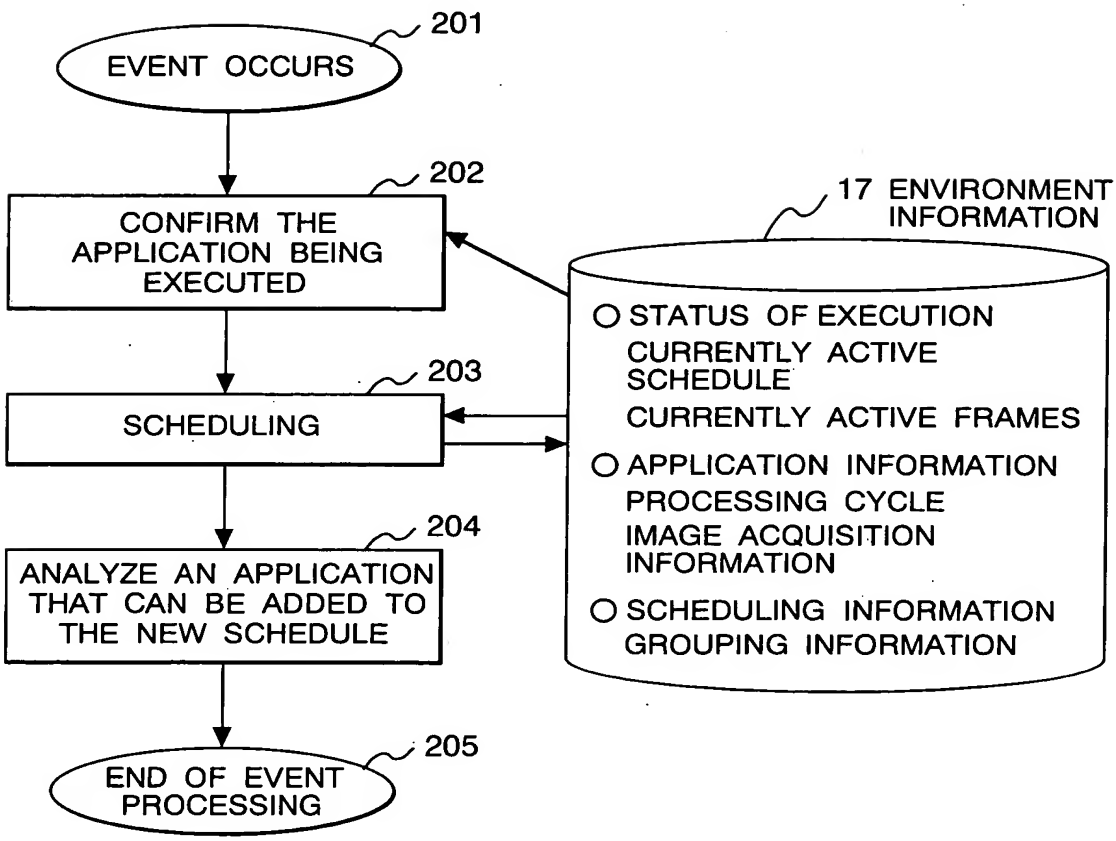

201
EVENT OCCURS
202
CONFIRM THE APPLICATION BEING EXECUTED
203
SCHEDULING
204
ANALYZE AN APPLICATION THAT CAN BE ADDED TO THE NEW SCHEDULE
205
END OF EVENT PROCESSING
17 ENVIRONMENT INFORMATION
O STATUS OF EXECUTION
CURRENTLY ACTIVE SCHEDULE
CURRENTLY ACTIVE FRAMES
O APPLICATION INFORMATION
PROCESSING CYCLE
IMAGE ACQUISITION INFORMATION
O SCHEDULING INFORMATION
GROUPING INFORMATION

FIG. 16

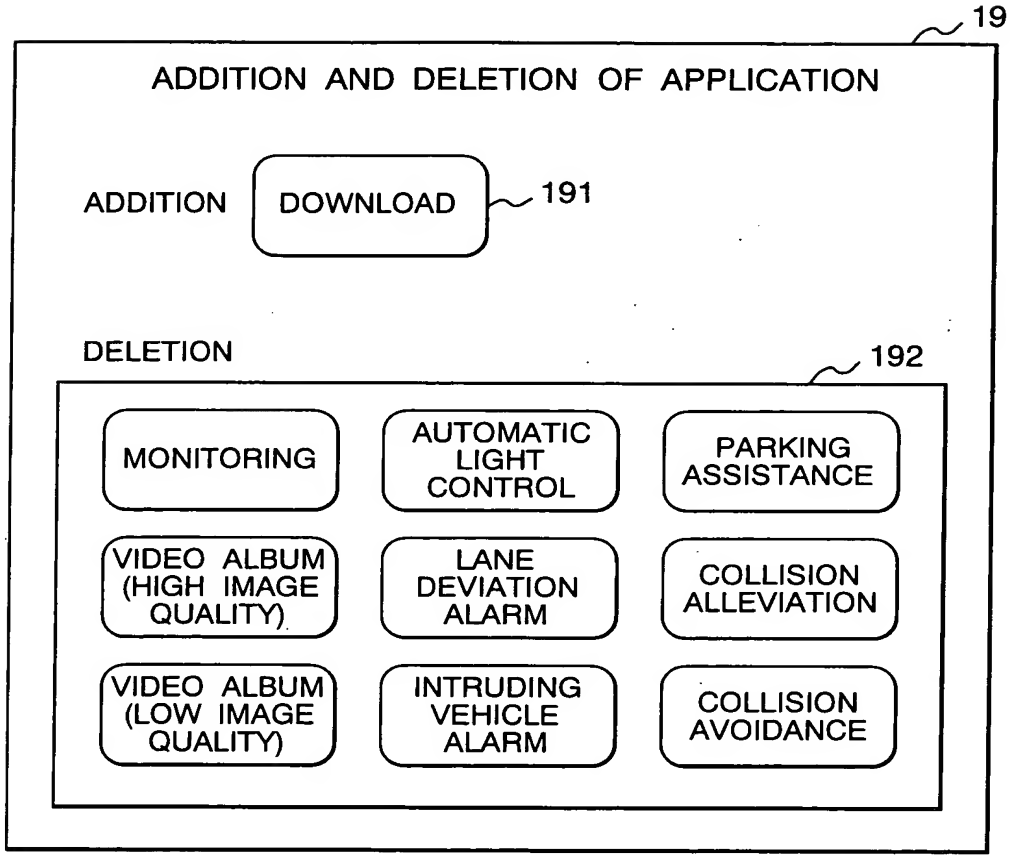

19
ADDITION AND DELETION OF APPLICATION
ADDITION
DOWNLOAD
191
DELETION
192
MONITORING
AUTOMATIC LIGHT CONTROL
PARKING ASSISTANCE
VIDEO ALBUM (HIGH IMAGE QUALITY)
LANE DEVIATION ALARM
COLLISION ALLEVIATION
VIDEO ALBUM (LOW IMAGE QUALITY)
INTRUDING VEHICLE ALARM
COLLISION AVOIDANCE

FIG. 17

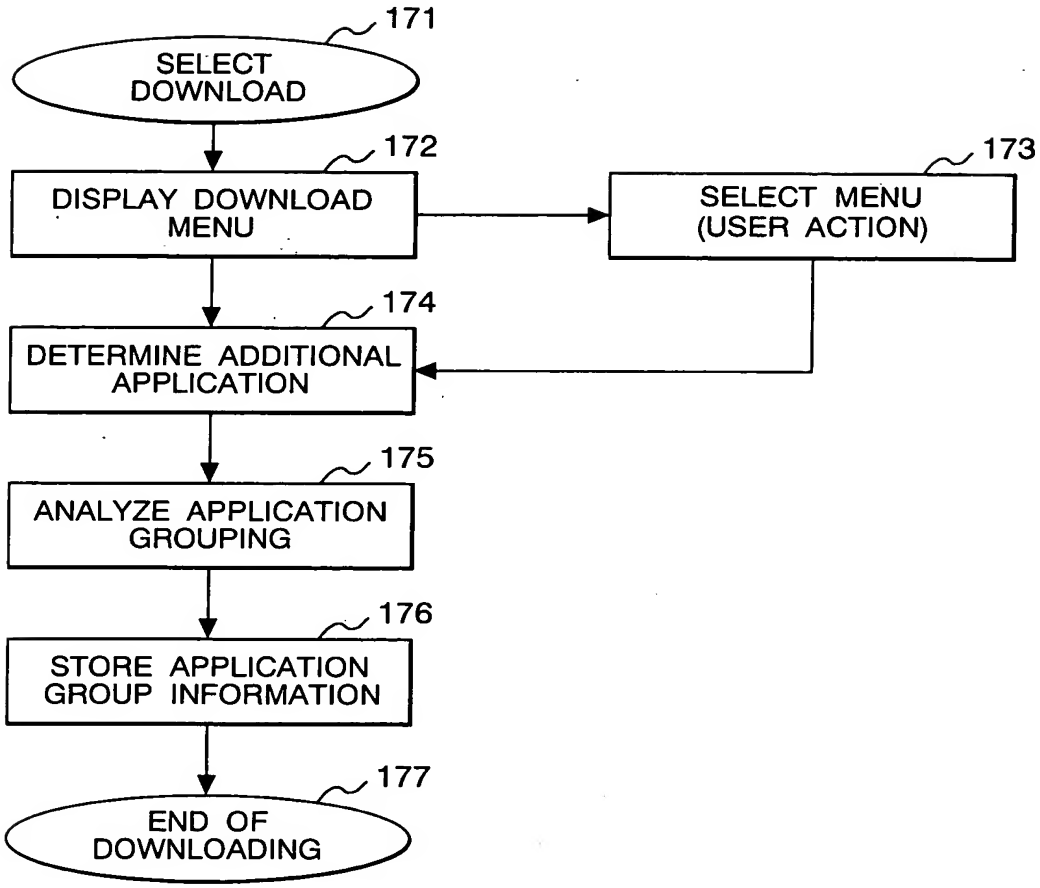
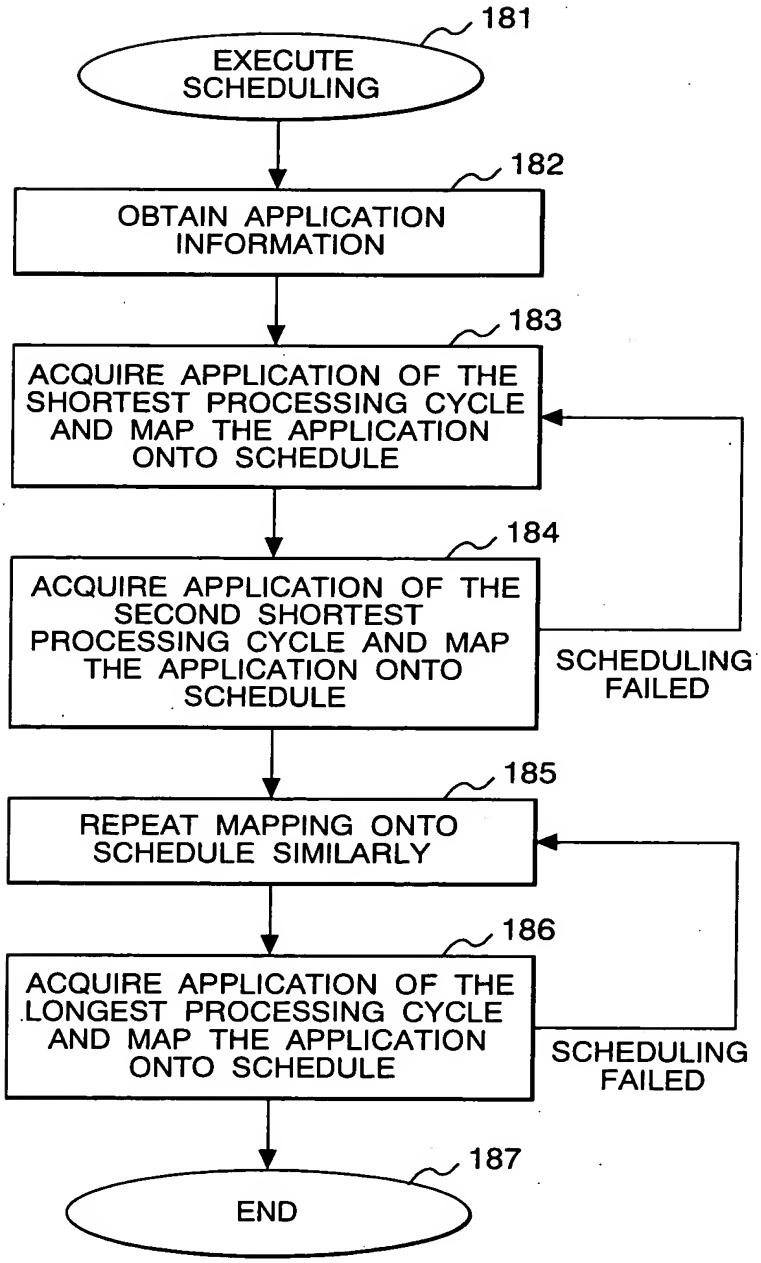

171
SELECT DOWNLOAD
172
DISPLAY DOWNLOAD MENU
173
SELECT MENU (USER ACTION)
174
DETERMINE ADDITIONAL APPLICATION
175
ANALYZE APPLICATION GROUPING
176
STORE APPLICATION GROUP INFORMATION
177
END OF DOWNLOADING

FIG. 18


181
EXECUTE SCHEDULING
182
OBTAIN APPLICATION INFORMATION
183
ACQUIRE APPLICATION OF THE SHORTEST PROCESSING CYCLE AND MAP THE APPLICATION ONTO SCHEDULE
184
ACQUIRE APPLICATION OF THE SECOND SHORTEST PROCESSING CYCLE AND MAP THE APPLICATION ONTO SCHEDULE
SCHEDULING FAILED
185
REPEAT MAPPING ONTO SCHEDULE SIMILARLY
186
ACQUIRE APPLICATION OF THE LONGEST PROCESSING CYCLE AND MAP THE APPLICATION ONTO SCHEDULE
SCHEDULING FAILED
187
END